Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in this Application:

Listing of Claims:

1. (Previously presented) A method for identifying a compound that regulates the activity of a non-homoserine lactone autoinducer-2 comprising:

(a) comparing the measured activity of non-homoserine lactone autoinducer-2 in the presence of the compound to the measured activity of non-homoserine lactone autoinducer-2 in the absence of the compound; and

(b) identifying the compound that regulates the activity of non-homoserine lactone autoinducer-2, wherein non-homoserine lactone autoinducer-2 is selected from the group consisting of 4,5-dihydroxy-2,3-pentanedione, 4-hydroxy-5-methyl-2H-furan-3-one, 2,3,4-trihydroxy-5-penten-1-one and SS-4,5-dihydroxy-2-cyclopenten-1-one.

2. (Original) The method of claim 1, wherein the autoinducer-2 is 4-hydroxy-5-methyl-2H-furan-3-one.

3. (Previously presented) The method of claim 1, wherein the autoinducer 2 is contacted with the compound *in vivo*.

4. (Previously presented) The method of claim 1, wherein the autoinducer 2 is contacted with the compound *in vitro*.

5. (Previously presented) The method of claim 1, wherein the regulation is by increasing the activity of the autoinducer-2.

6. (Previously presented) The method of claim 1, wherein the regulation is by decreasing the activity of the autoinducer-2.

7. (Original) The method of claim 1, wherein the compound is a polypeptide.

8. (Original) The method of claim 1, wherein the compound is a small molecule.

9. (Original) The method of claim 1, wherein the compound is a nucleic acid.

10. (Previously presented) A method for identifying an analog that regulates the activity of a non-homoserine lactone autoinducer-2, comprising:

(a) providing a bacterial cell that is capable of producing a detectable amount of light in response to the non-homoserine lactone autoinducer-2;

(b) contacting the bacterial cell with an analog of the non-homoserine lactone autoinducer-2; and

(c) comparing the amount of light produced by the bacterial cell in the presence and absence of the analog, wherein a change in the production of light is indicative of an analog that regulates the activity of the non-homoserine lactone autoinducer-2, wherein the non-homoserine lactone autoinducer-2 is selected from the group consisting of 4,5-dihydroxy-2,3-pentanedione, 4-hydroxy-5-methyl-2H-furan-3-one, 2,3,4-trihydroxy-5-penten-1-one and SS-4,5-dihydroxy-2-cyclopenten-1-one.

11. (Previously presented) The method of claim 10, wherein the bacterial cell contains non-homoserine lactone autoinducer-2 that is endogenous non-homoserine lactone autoinducer-2.

12. (Previously presented) The method of claim 10, wherein the bacterial cell is also contacted with non-homoserine lactone autoinducer-2 that is synthesized in a bacterial cell.

13. (Previously presented) The method of claim 10, wherein the bacterial cell is also contacted with non-homoserine lactone autoinducer-2 that is exogenous autoinducer-2.

14. (Previously presented) The method of claim 10, wherein the contacting is *in vitro*.

15. (Previously presented) The method of claim 10, wherein the contacting is *in vivo*.

16. (Previously presented) The method of claim 10, further comprising contacting the bacterial cell with the non-homoserine lactone autoinducer-2.

17. (Previously presented) The method of claim 10, wherein the regulation is by inhibition of non-homoserine lactone autoinducer-2 activity.

18. (Previously presented) The method of claim 10, wherein the regulation is by enhancement of non-homoserine lactone autoinducer-2 activity.

19. (Canceled).

20. (Previously presented) The method of claim 10, wherein the bacterial cell further comprises at least one alteration in a gene locus that participates in an autoinducer pathway, wherein the alteration inhibits the production or detection of an autoinducer.

21. (Original) The method of claim 20, wherein the alteration in a gene locus comprises an alteration in the LuxS gene.

22. (Previously presented) The method of claim 20, wherein the alteration in a gene locus inhibits production of non-homoserine lactone autoinducer-2.

23. (Original) The method of claim 20, wherein the alteration in a gene locus comprises an alteration in the LuxN gene.

24. (Original) The method of claim 20, wherein the alteration in a gene locus inhibits detection of autoinducer-1.

25. (Original) The method of claim 20, wherein the alteration is in the LuxN and LuxS loci.

26. (Previously presented) The method of claim 20, wherein the bacterial cell is *V. harveyi* strain MM32 (ATCC access No. BAA-1121).

27. (Previously presented) A method for identifying a compound that regulates the production or activity of non-homoserine lactone autoinducer-2, comprising:

contacting a bacterial cell that produces non-homoserine lactone autoinducer-2 with the compound, and

determining whether non-homoserine lactone autoinducer-2 activity is present in the bacterial cell, wherein non-homoserine lactone autoinducer-2 is selected from the group consisting of 4,5-dihydroxy-2,3-pentanedione, 4-hydroxy-5-methyl-2H-furan-3-one, 2,3,4-trihydroxy-5-penten-1-one and SS-4,5-dihydroxy-2-cyclopenten-1-one.

28. (Previously presented) The method of claim 27, wherein non-homoserine lactone autoinducer-2 activity is determined by detecting the inhibition of non-homoserine lactone autoinducer-2 production.

29. (Previously presented) The method of claim 28, wherein non-homoserine lactone autoinducer-2 activity is determined by detecting a signal produced in the presence of non-homoserine lactone autoinducer-2.

30. (Previously presented) The method of claim 29, wherein the method detects an antagonist of non-homoserine lactone autoinducer-2.

31. (Original) The method of claim 30, wherein the method detects a change in luminescence from a reporter bacterial strain.

32. (Original) The method of claim 31, wherein the bacterial strain is of the genus *Vibrio*.

33. (Original) The method of claim 32, wherein the bacterial strain is of the species *Vibrio harveyi*.

34. (Previously presented) The method of claim 33, wherein the bacterial strain is *Vibrio harveyi* BB170 (ATCC access No. BAA-1117).

35. (Previously presented) The method of claim 33, wherein the bacterial strain is *Vibrio harveyi* MM32 (ATCC access No. BAA-1121).

36. (Previously presented) A method for detecting a non-homoserine lactone autoinducer-2-associated bacterial biomarker comprising;

(a) providing at least one bacterial cell that responds to non-homoserine lactone autoinducer-2 by generating a bacterial biomarker;

(b) contacting said at least one bacterial cell with a non-homoserine lactone autoinducer-2 molecule under conditions and for such time as to promote induction of a bacterial biomarker; and

(c) detecting the bacterial biomarker, wherein the non-homoserine lactone autoinducer-2 is selected from the group consisting of 4,5-dihydroxy-2,3-pentanedione, 4-hydroxy-5-methyl-2H-furan-3-one, 2,3,4-trihydroxy-5-penten-1-one and SS-4,5-dihydroxy-2-cyclopenten-1-one.

37. (Canceled).

38. (Canceled).

39. (Previously presented) A method for detecting an autoinducer-associated biomarker comprising:

(a) providing at least one cell that responds to an autoinducer by a change in a biomarker of the cell,

(b) contacting the at least one cell with an autoinducer molecule under conditions and for such time as to promote induction of a biomarker; and

(c) detecting the biomarker, wherein the autoinducer is not a homoserine lactone.

40. (Previously presented) The method of claim 39, wherein the autoinducer is non-homoserine lactone autoinducer-2, and wherein the non-homoserine lactone autoinducer-2 is selected from the group consisting of 4,5-dihydroxy-2,3-pentanedione, 4-hydroxy-5-methyl-2H-furan-3-one, 2,3,4-trihydroxy-5-penten-1-one and SS-4,5-dihydroxy-2-cyclopenten-1-one.

41. (Original) The method of claim 40, wherein the autoinducer-2 is 4-hydroxy-5-methyl-2H-furan-3-one.

42. (Previously presented) A method for identifying a compound that regulates non-homoserine lactone autoinducer-2 binding to a non-homoserine lactone autoinducer-2 receptor, comprising:

(a) contacting non-homoserine lactone autoinducer-2 and the non-homoserine lactone autoinducer-2 receptor with the compound to allow non-homoserine lactone autoinducer-2 binding to the receptor;

(b) contacting the product of (a) with a cell capable of producing light in response to non-homoserine lactone autoinducer-2 binding to the receptor; and

(c) measuring the effect of the compound on light production, wherein a change in light production in the presence of the compound, compared to light production in the absence of the compound, identifies the compound as one that regulates binding of non-homoserine lactone autoinducer-2 to receptor, wherein the non-homoserine lactone autoinducer-2 is selected from the group consisting of 4,5-dihydroxy-2,3-pentanedione, 4-hydroxy-5-methyl-2H-furan-3-one, 2,3,4-trihydroxy-5-penten-1-one and SS-4,5-dihydroxy-2-cyclopenten-1-one.

43. (Original) The method of claim 42, wherein the compound is selected from the group consisting of competitive inhibitors and suicide inhibitors.

44. (Previously presented) The method of claim 42, wherein the receptor is selected from the group consisting of luxP and luxN.

45. (Previously presented) The method of claim 42, wherein the non-homoserine lactone autoinducer-2 is allowed to form a complex with the receptor in the absence of the compound.

46. (Previously presented) The method of claim 42, wherein the non-homoserine lactone autoinducer-2/receptor complex is bound to a solid support medium.

47. (Original) The method of claim 46 wherein the solid support medium is selected from the group consisting of a column matrix and a microtiter dish well.

48. (Previously presented) The method of claim 47, wherein the non-homoserine lactone autoinducer-2/receptor complex is bound to a solid support medium through a linkage selected from the group consisting of amide, ester, and ether.

49-98. (Canceled).

99. (Previously presented) A method for identifying a compound that regulates the activity of autoinducer-2 comprising:

(a) comparing the measured activity of autoinducer-2 in the presence of the compound to the measured activity of autoinducer-2 in the absence of the compound; and

(b) identifying the compound that regulates the activity of autoinducer-2, wherein the autoinducer-2 is 4-hydroxy-5-methyl-2H-furan-3-one.

100. (Previously presented) A method for detecting an autoinducer-associated biomarker comprising:

(a) providing at least one cell that responds to an autoinducer-2 by a change in a biomarker of the cell,

(b) contacting the at least one cell with an autoinducer-2 molecule under conditions and for such time as to promote induction of a biomarker; and

(c) detecting the biomarker, wherein the autoinducer-2 is 4-hydroxy-5-methyl-2H-furan-3-one.